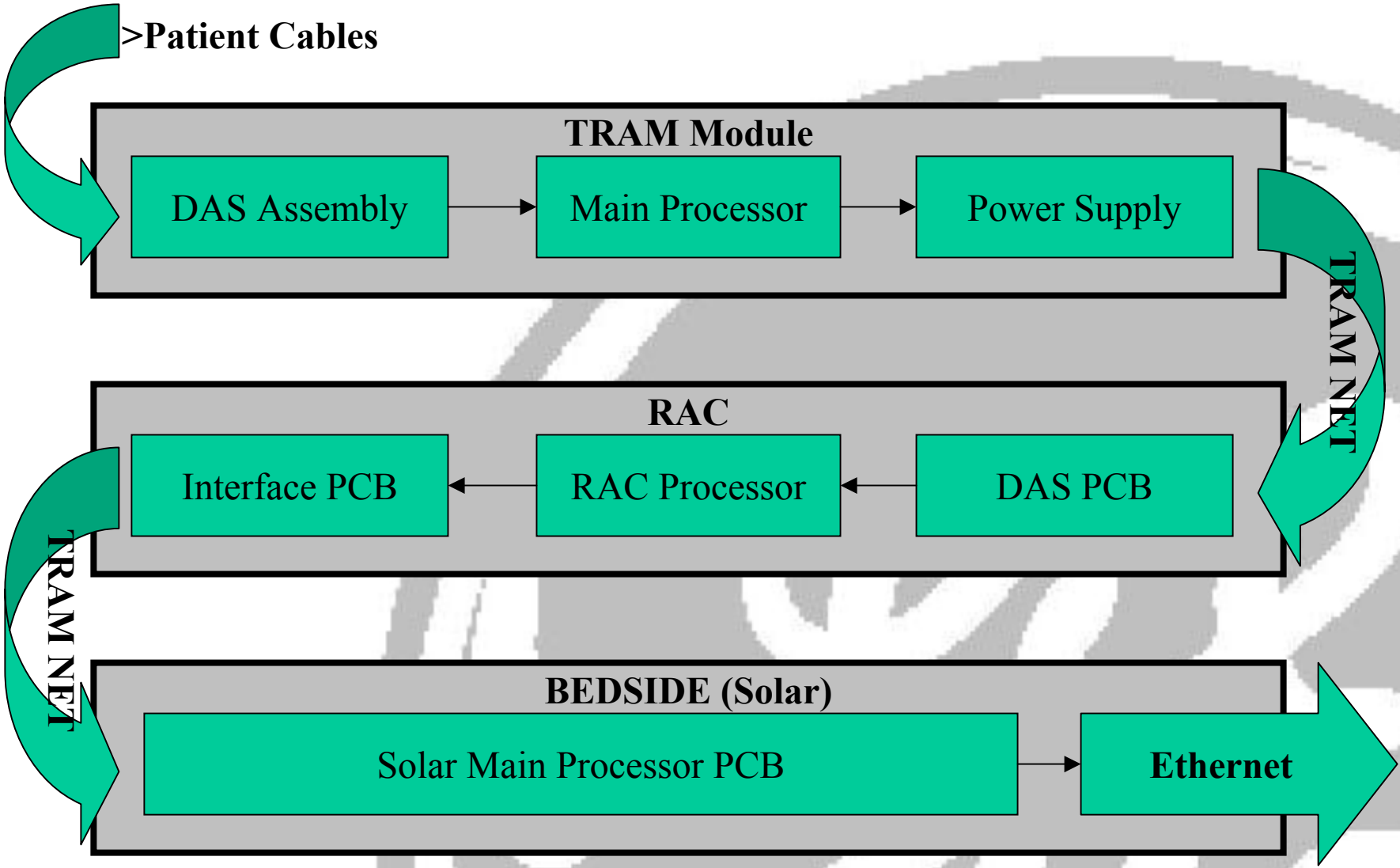
TRAM & RAC

GE – Clinical Services Inc.
Technical Training Department

Bedside Communications Flow



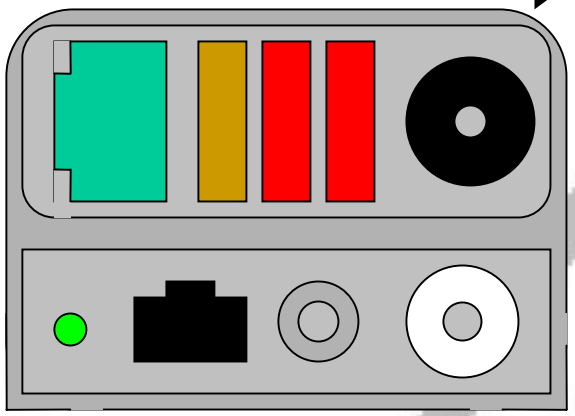
TRAM

Transport Remote Acquisition Module

- **Acts as the point of Parameter collection from the patient**
- **Stores patient data**
  - **24 hours (FIFO)**
  - **36 Events**
- **Outputs parameters and waveforms to a bedside or SmartPac transport display**
- **Model numbers depend on parameters offered**

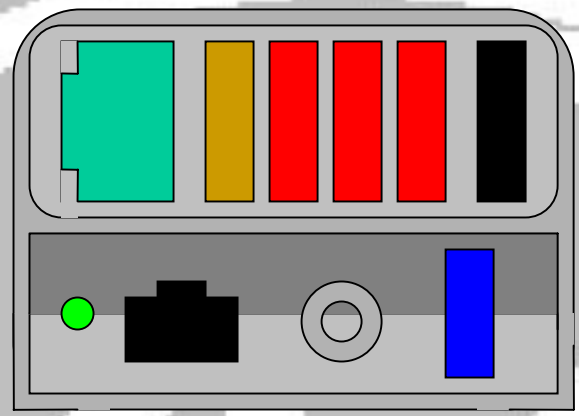
TRAM Models

2 Styles of NIBP Connector



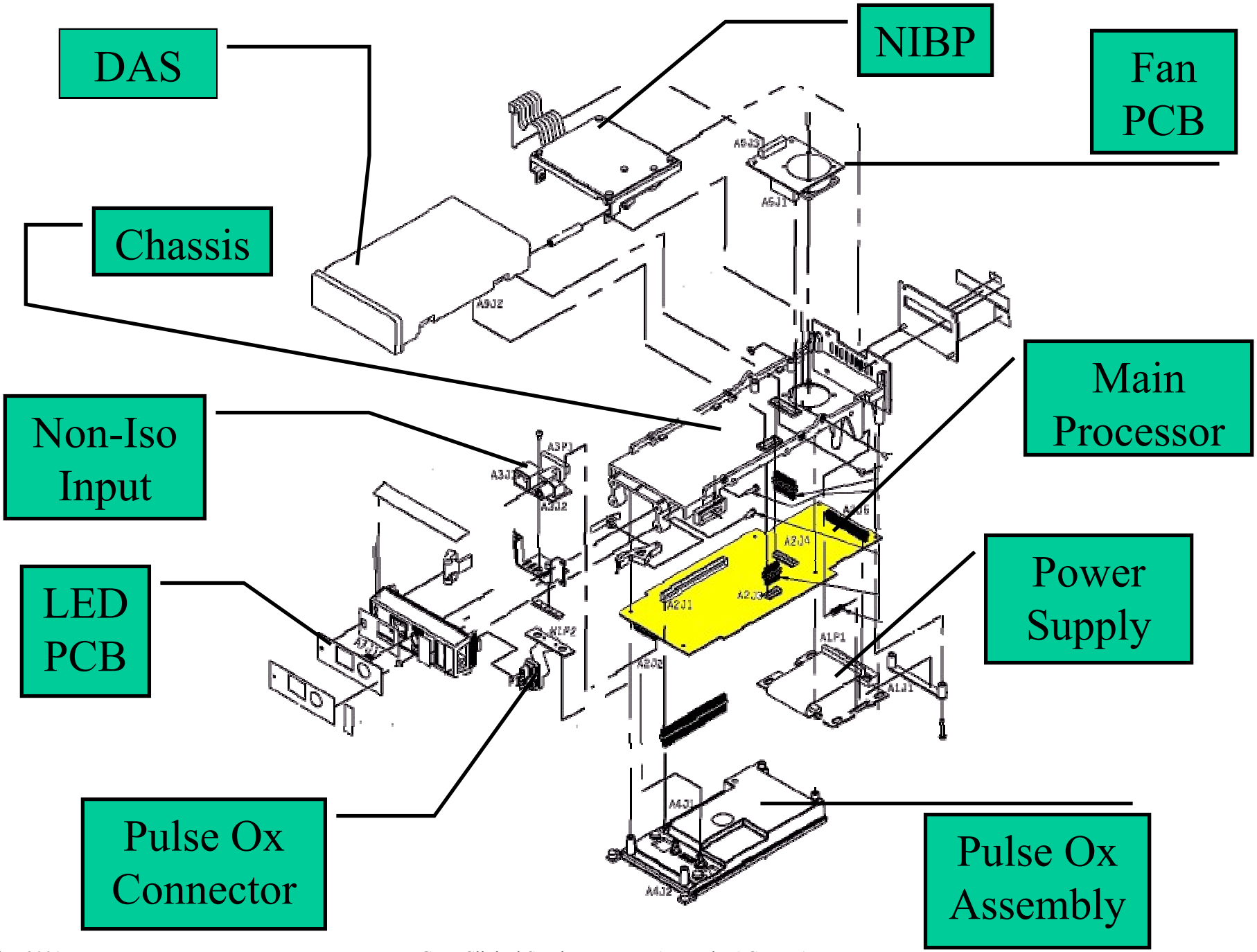
Round, White Pulse Ox connector = Ohmeda (X00)

Dual color Lower bezel Identifies 12SL

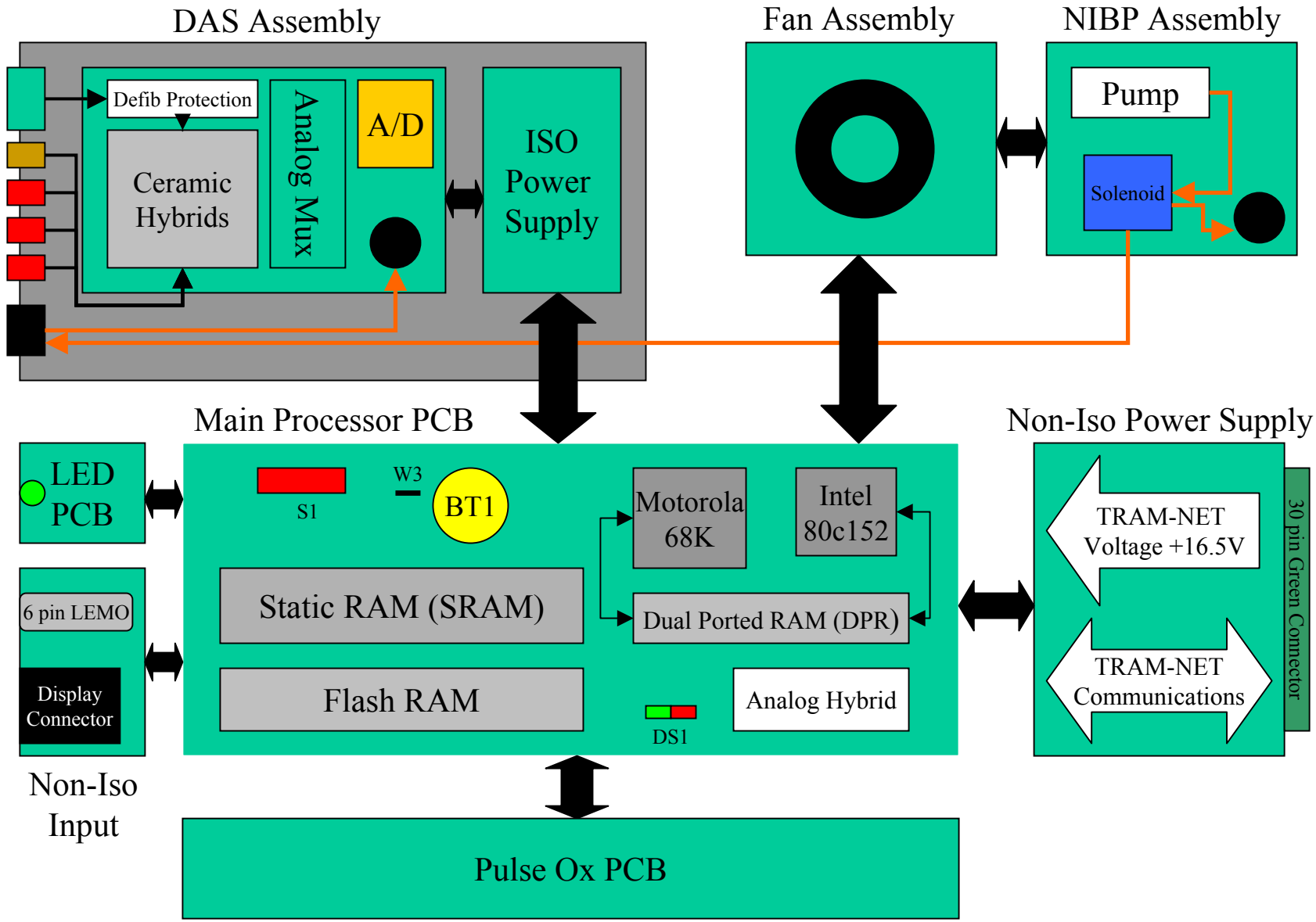


Blue, Nicolay Pulse Ox connector = Marquette/Nellcor (X50)

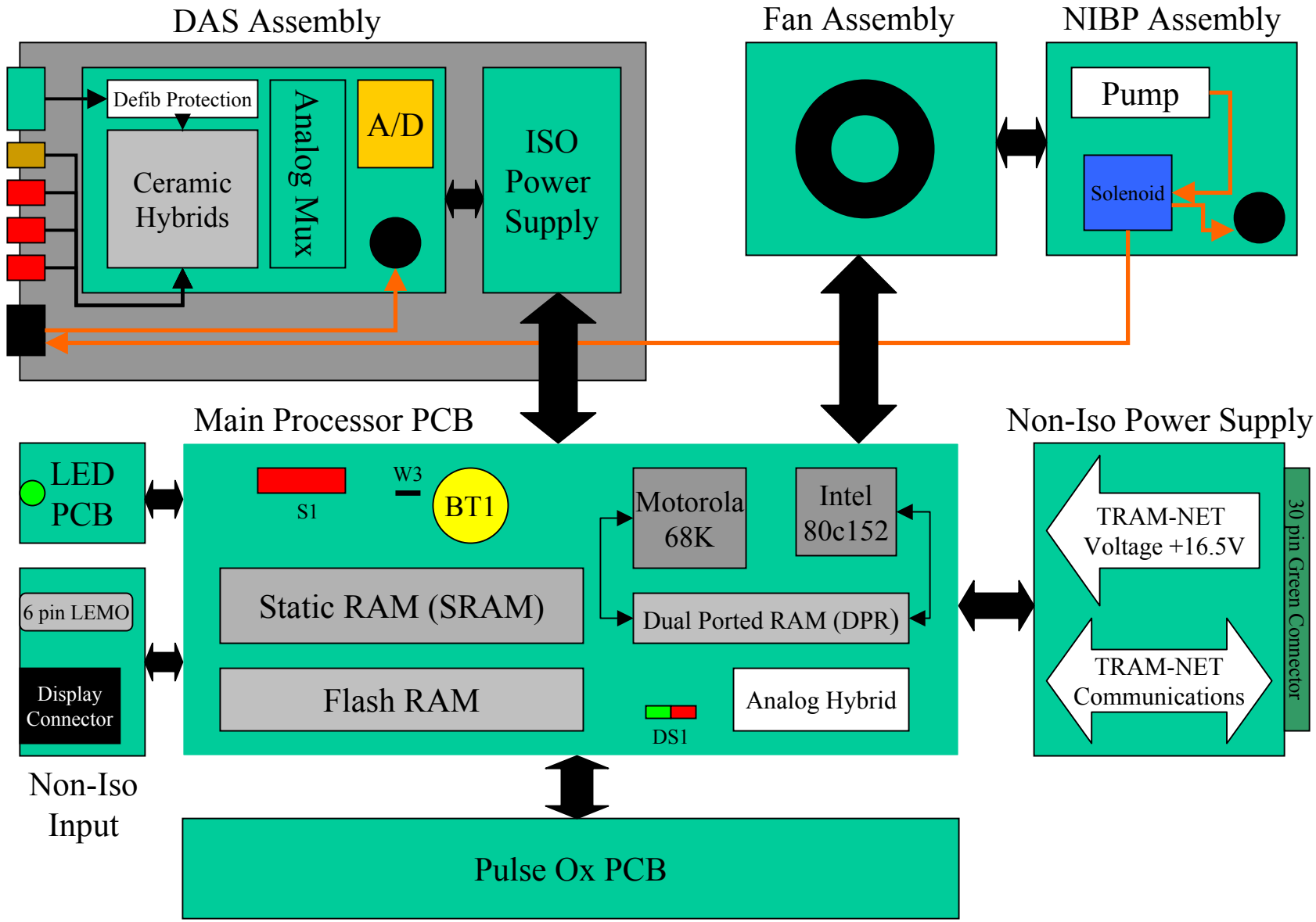
Model	ECG	TEMP/CO	IBP	NIBP
200	Y	Y	2	Round
400	Y	Y	3	Nicolay
600	Y	Y	4	N/A
800	Y	Y	N	Nicolay


DAS
NIBP
Fan PCB
Chassis
Non-Iso Input
Main Processor
LED PCB
Power Supply
Pulse Ox Connector
Pulse Ox Assembly

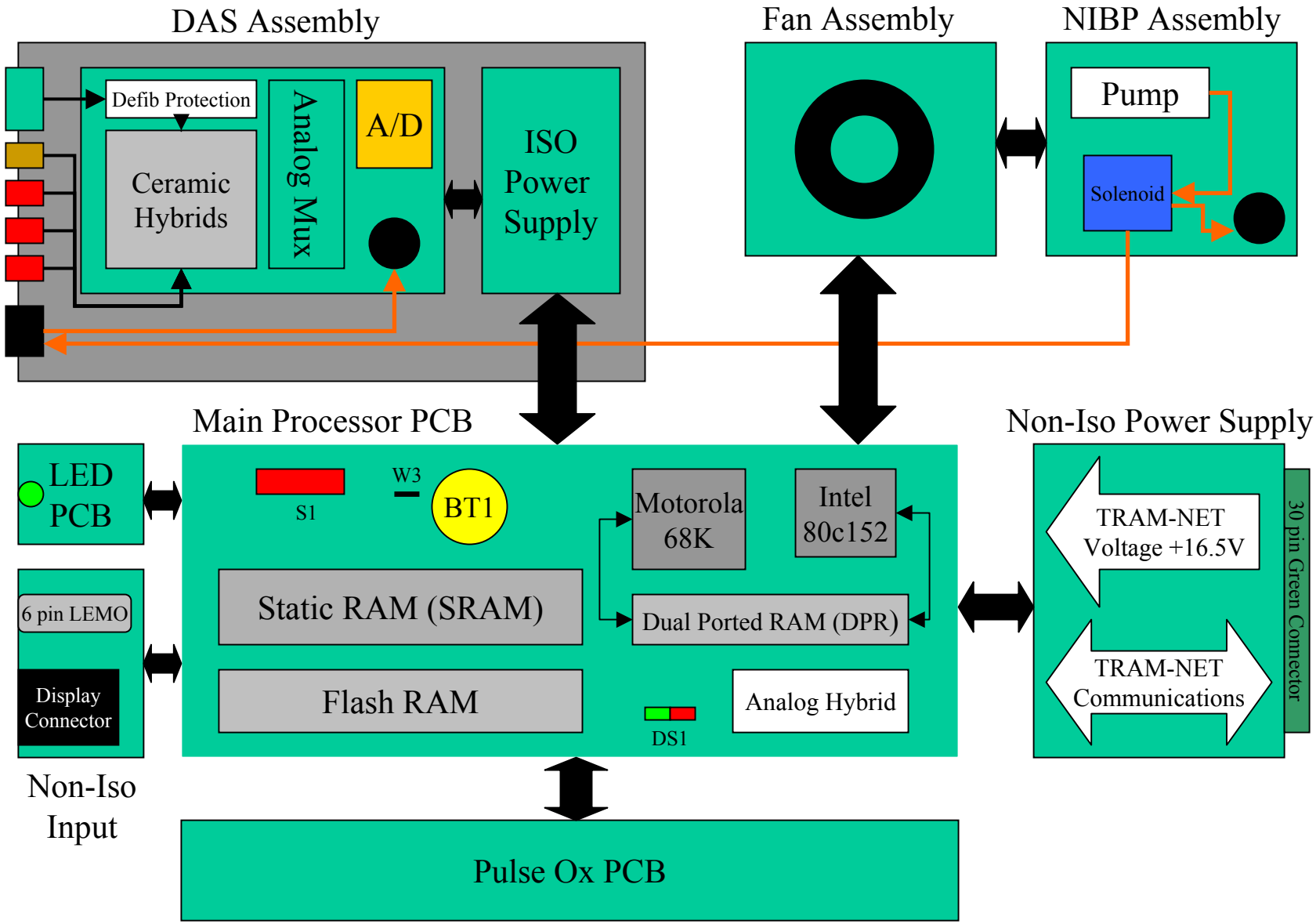
TRAM Block Diagram



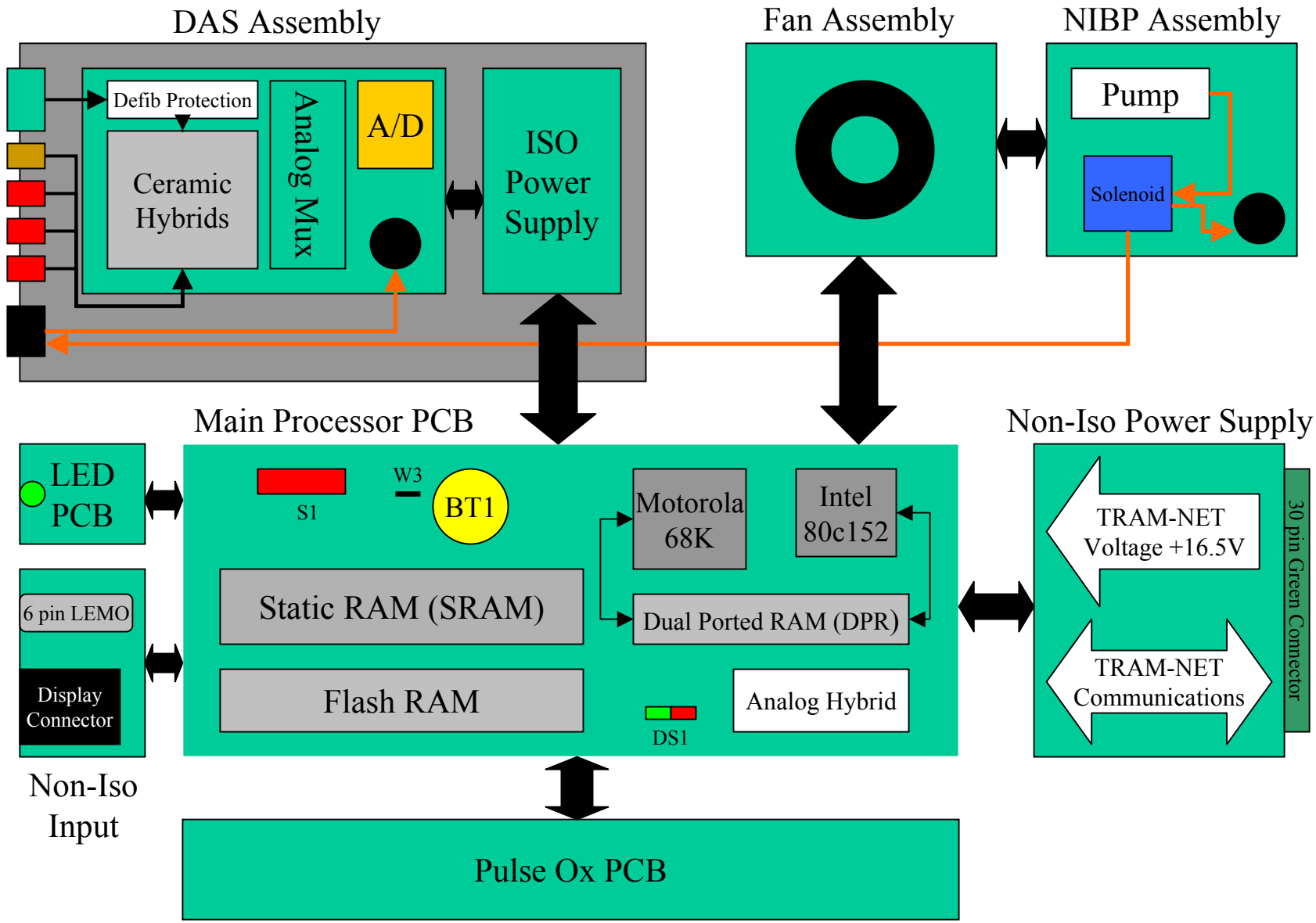
TRAM Block Diagram



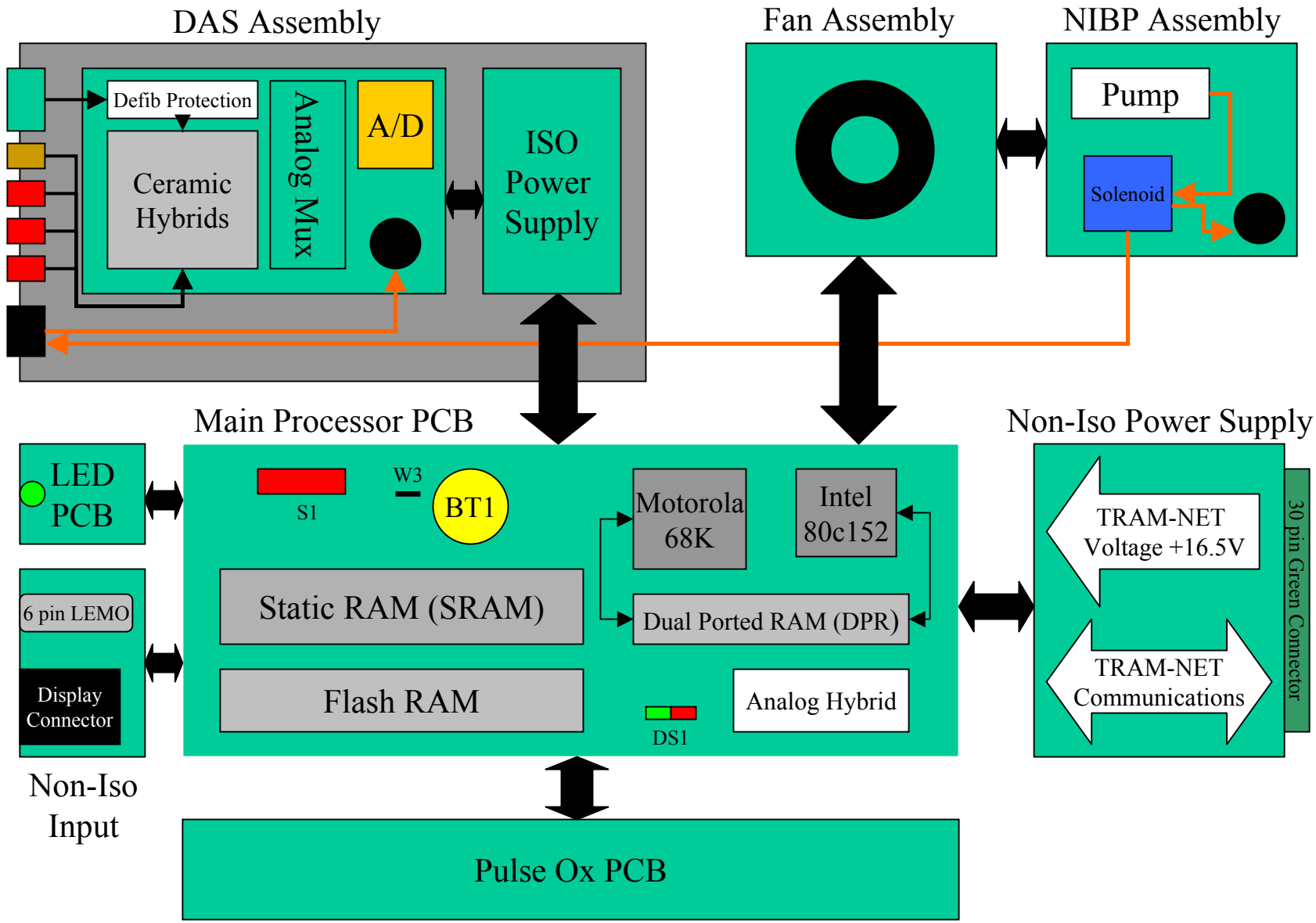
TRAM Block Diagram



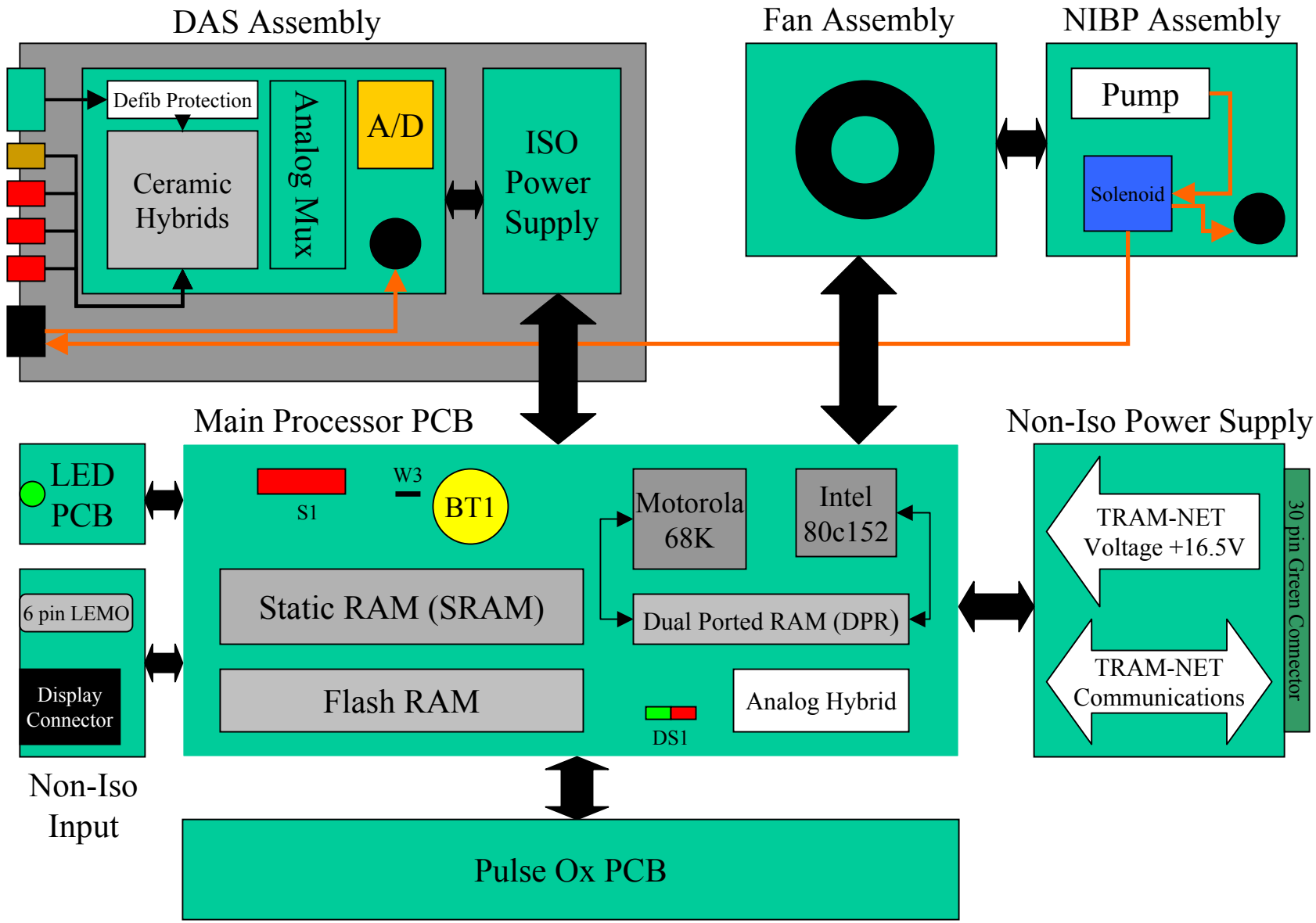
TRAM Block Diagram



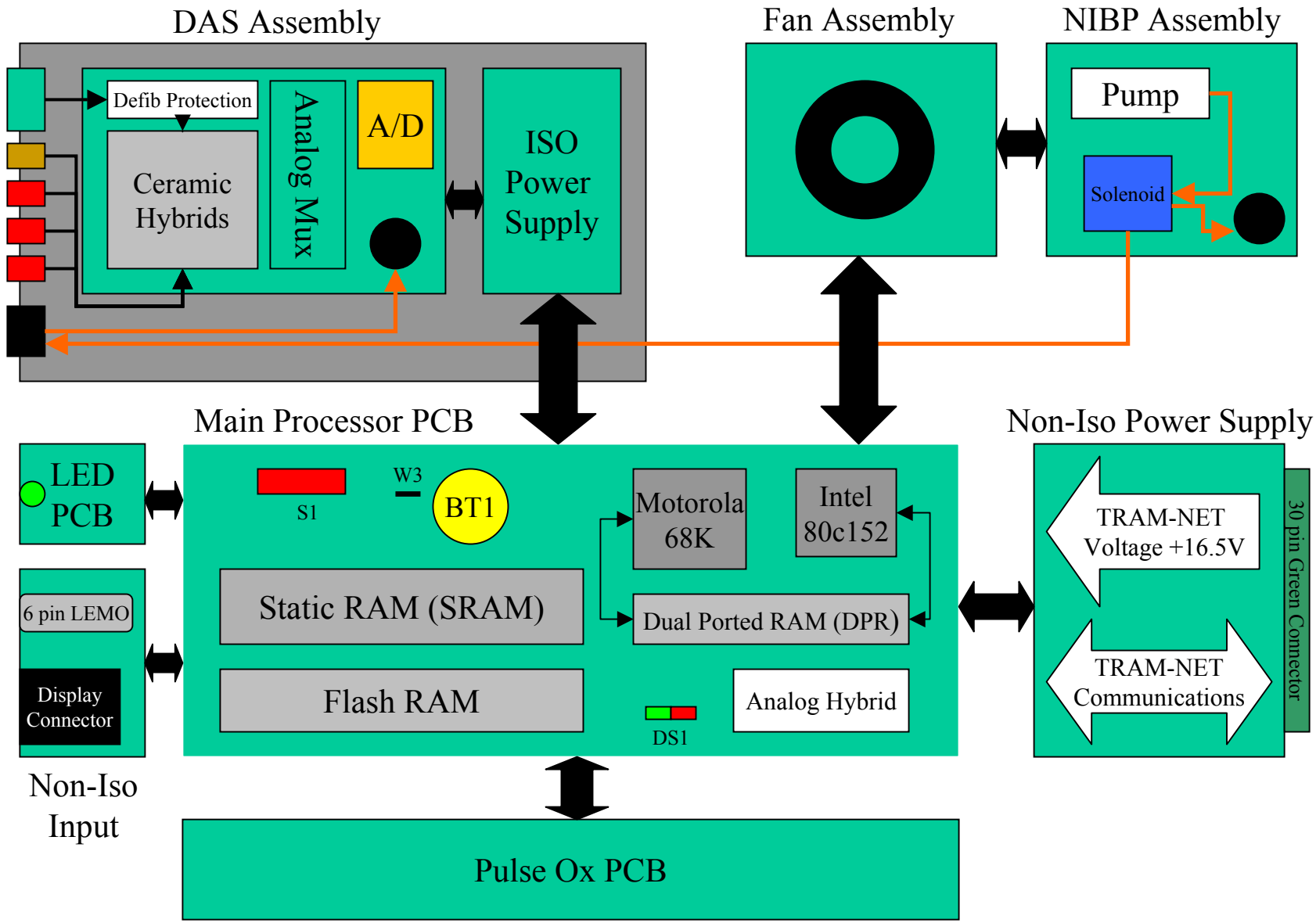
TRAM Block Diagram



TRAM Block Diagram



TRAM Block Diagram



Jumpers, Adjustments & Switches

Jumpers, Main PCB

W1	Defib Sync Level +5V or +15V
W2	Defib Sync Duration 100ms or 10ms
W3	Battery Disconnect

Adjustments, Main PCB

C2	Clock frequency
R64	Battery Low Voltage Trip point (2.1V)

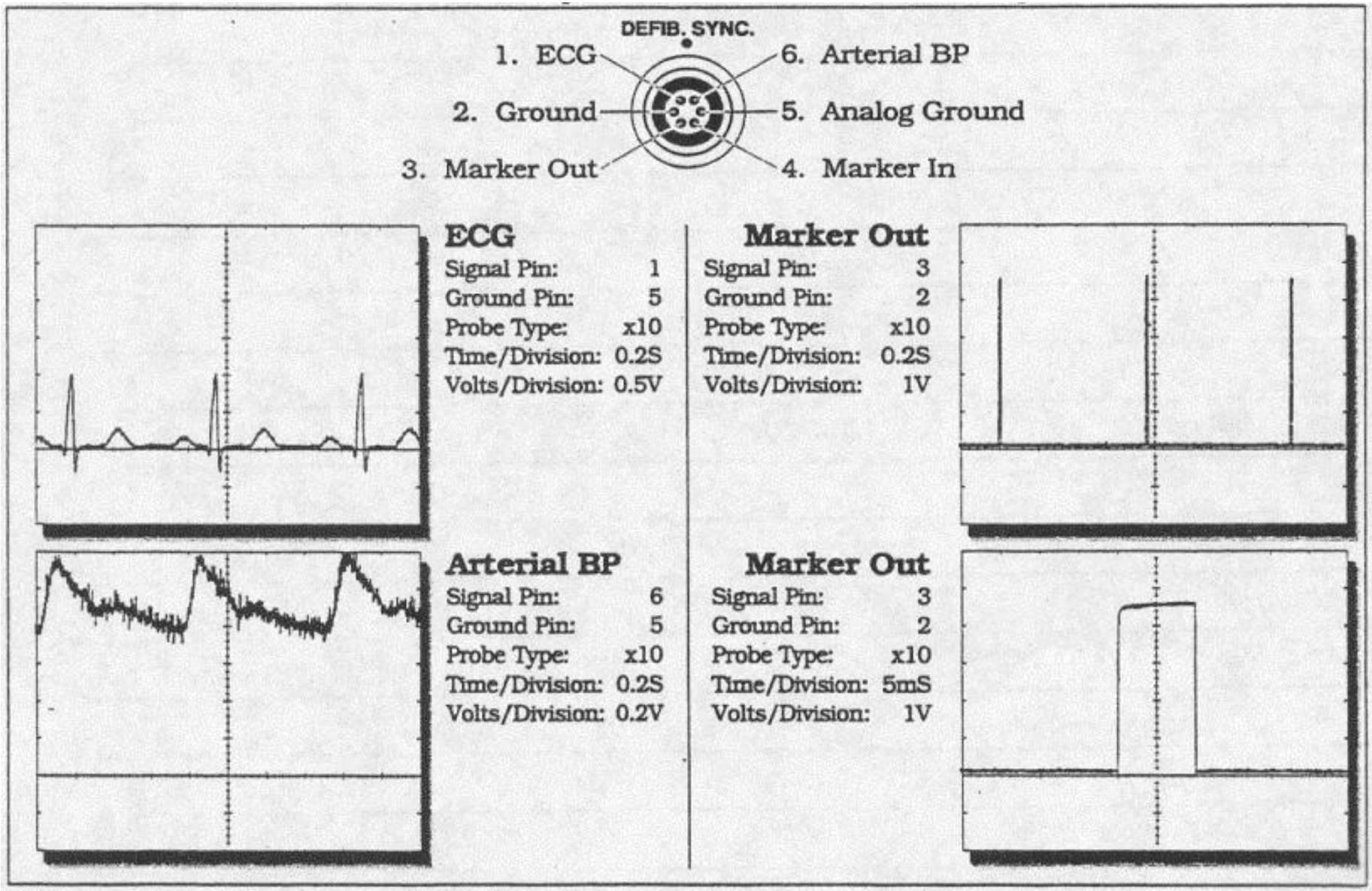
Adjustments, Power Supply

R14	Clock frequency

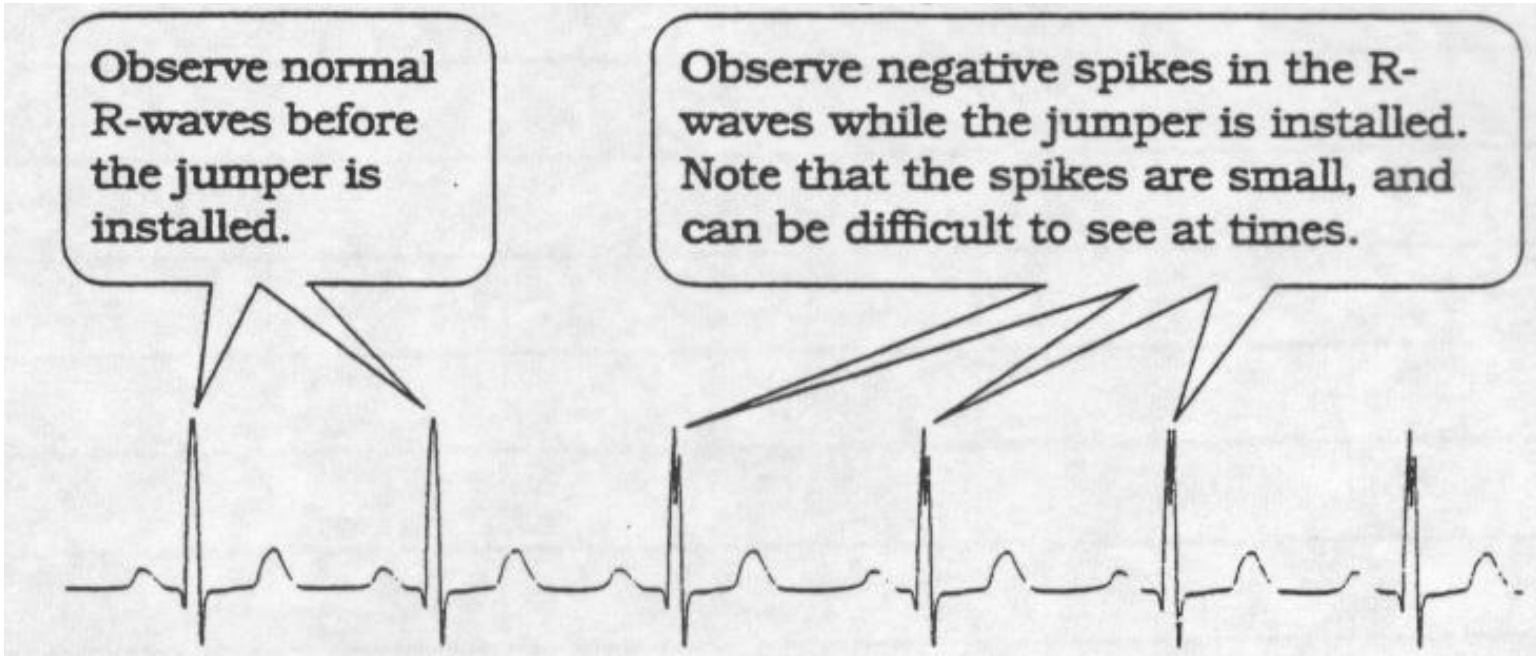
Switches (S1), Main PCB

Switch	Use	ON	OFF
1	68000 Clock	Disable	Enable
2	68000 Clock Freq	7.37 MHz	14.74 MHz
3	Update & Calibration	Inhibit	Allow
4	Integral Battery	TRAM 300	All Others
5	Not Used	N/A	N/A
6	Power Frequency	50 Hz	60Hz

6 Pin LEMO Connector

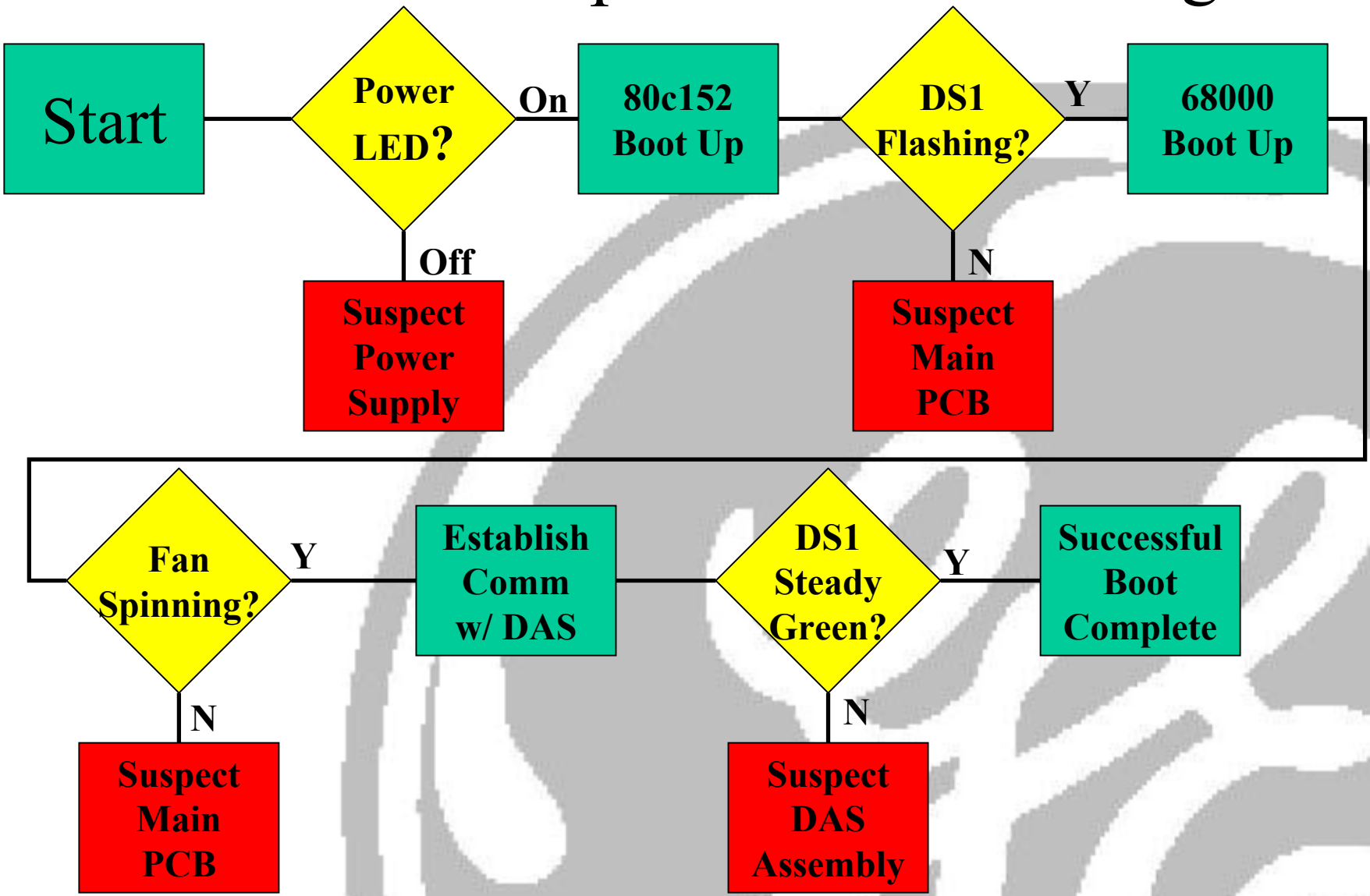


Defib Sync Test


Observe normal R-waves before the jumper is installed.
Observe negative spikes in the R-waves while the jumper is installed. Note that the spikes are small, and can be difficult to see at times.

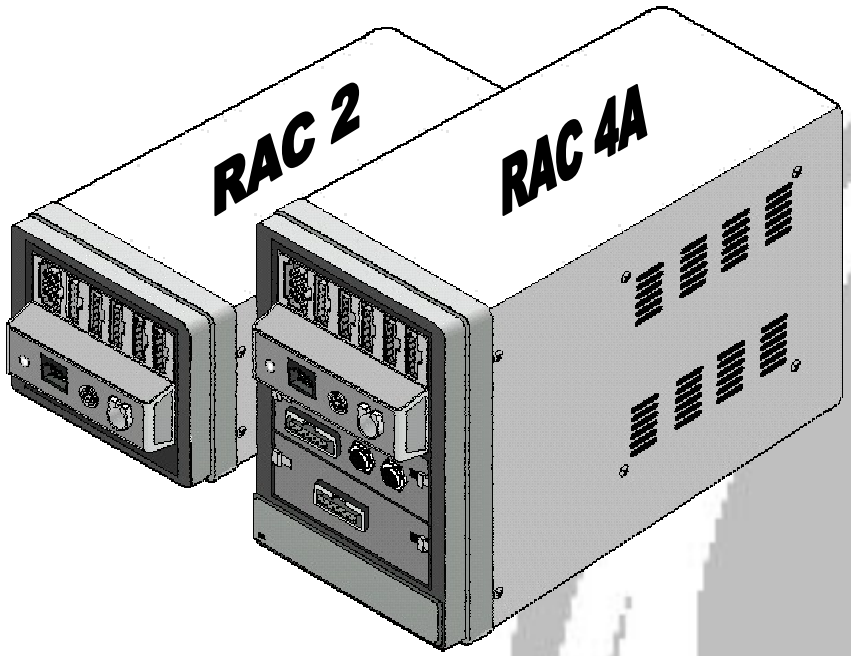
Short pins 3 and 4 together
Observe negative spike in the R-wave

TRAM Boot Up & Troubleshooting



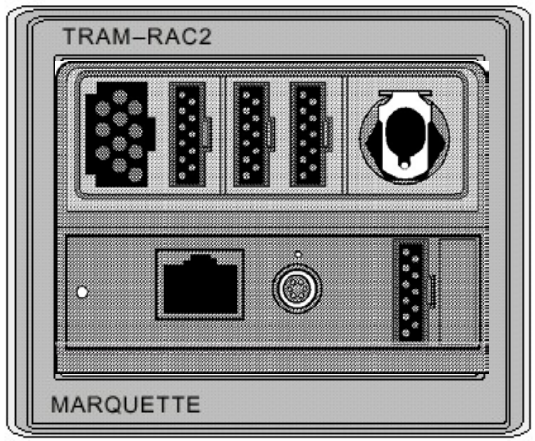
RAC

Remote Acquisition Carrier

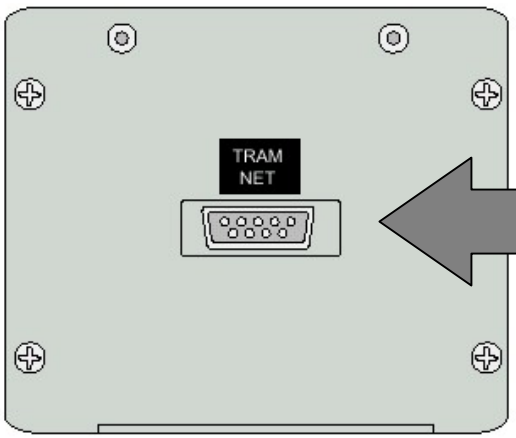


- **Acts as a communications pathway between bedside and module**
- **RAC2 is only a simple pass-through**
- **RAC4A can convert analog to digital and digital to TRAMNET**

RAC2

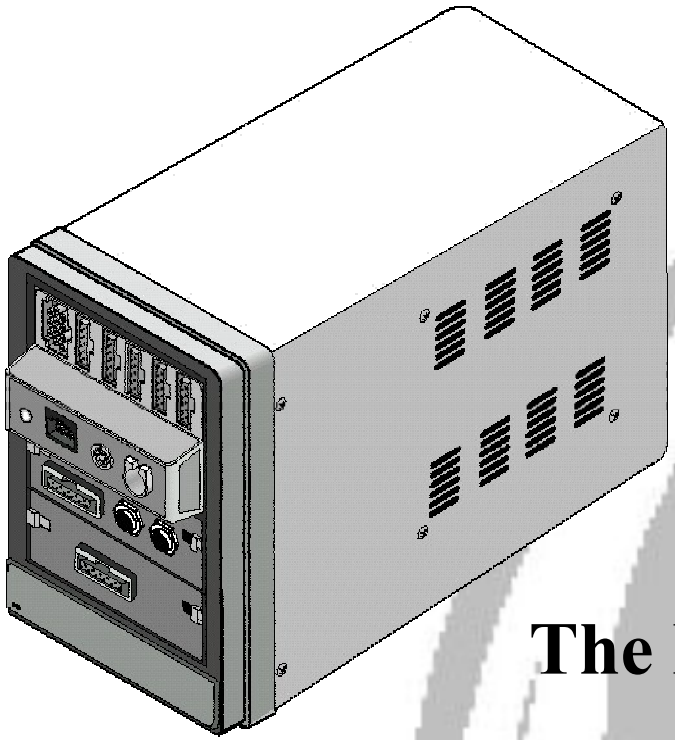


The RAC2 can house 1 TRAM OR SAM Module



One 9 pin TRAMNET labeled connector on rear

RAC4A



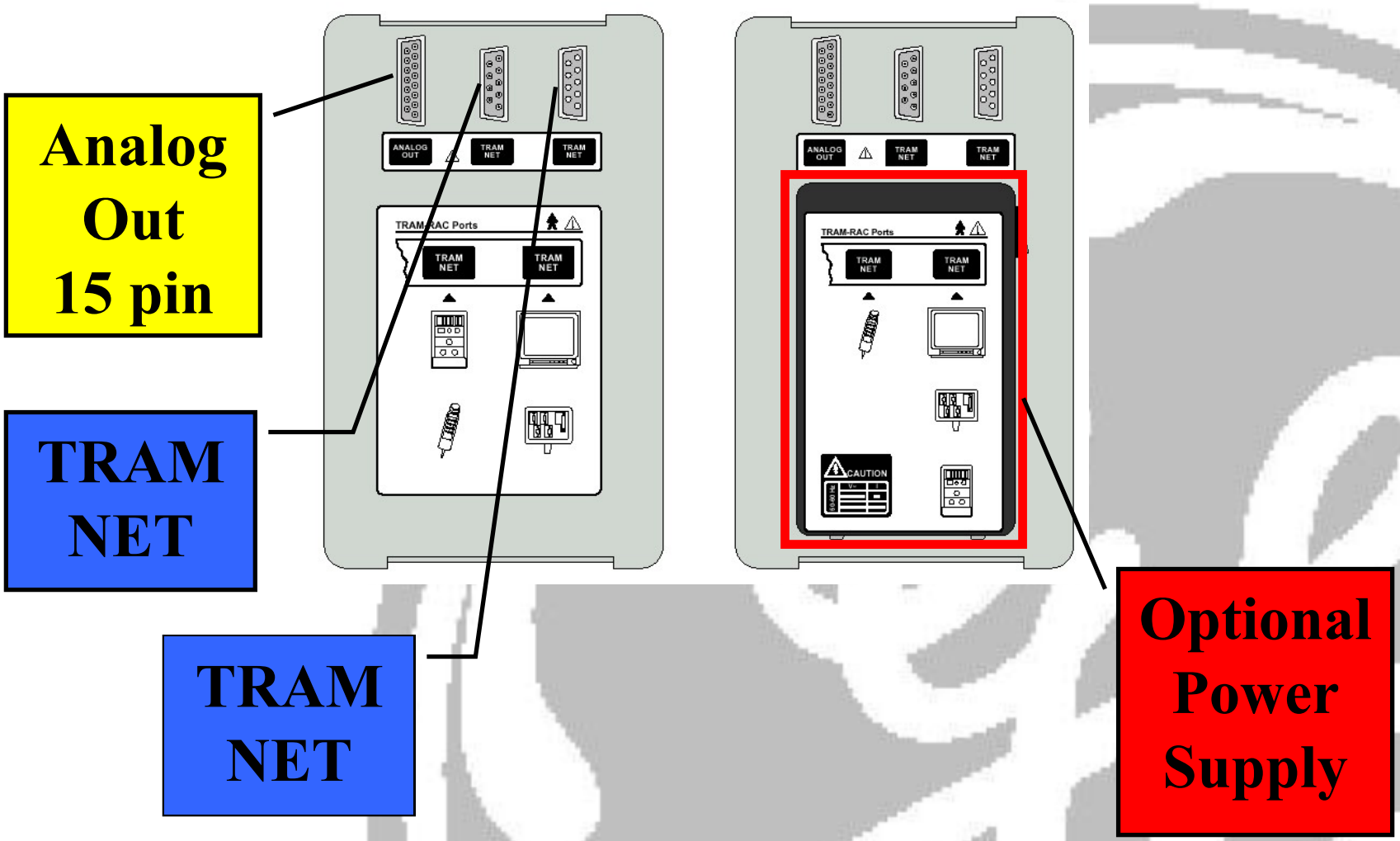
The RAC4A can support up to:

1 TRAM and 1 SAM

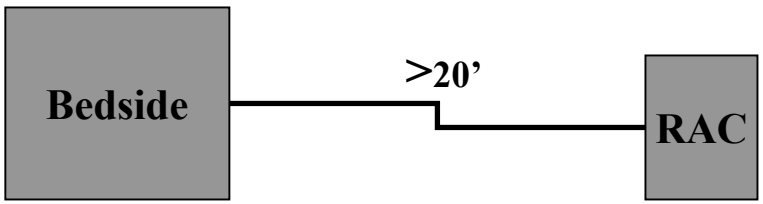
Or 1 TRAM and 2 Single stack

Or 4 Single stack modules

RAC4A Rear Connectors

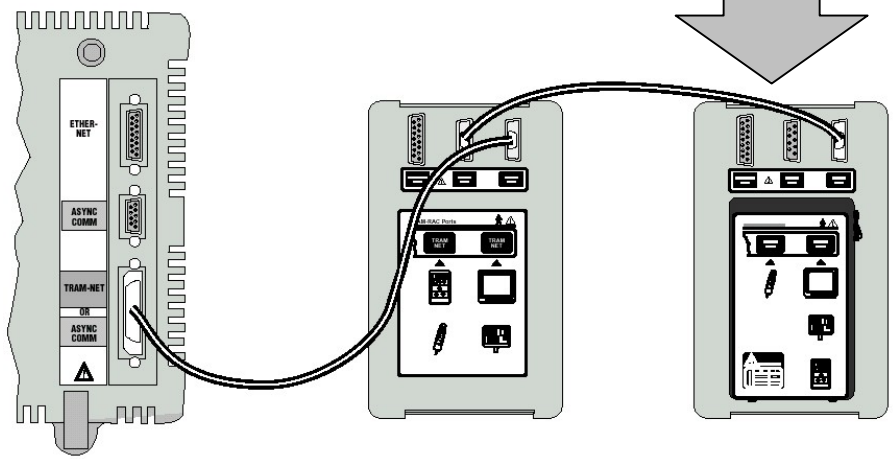


When is the "Optional Power Supply" not optional?



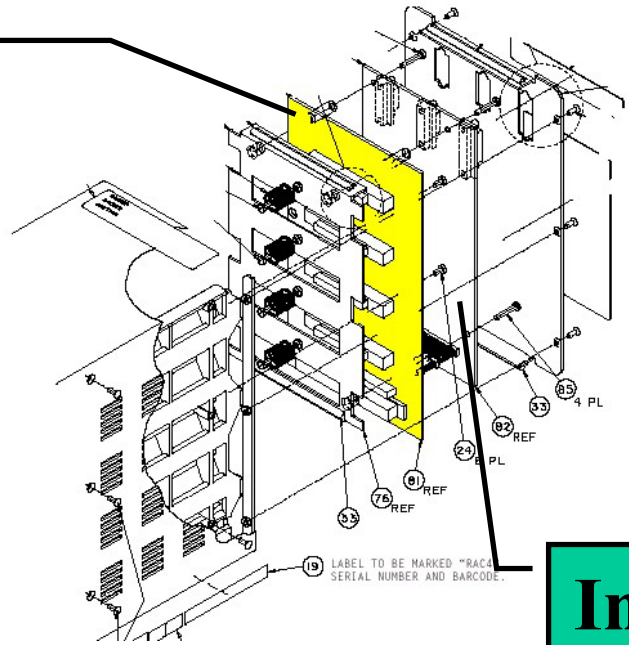
If you have 2 RACs, the 2nd RAC must have a Power Supply

If your TRAMNET cable is greater than 20' in length, you must have Power Supply

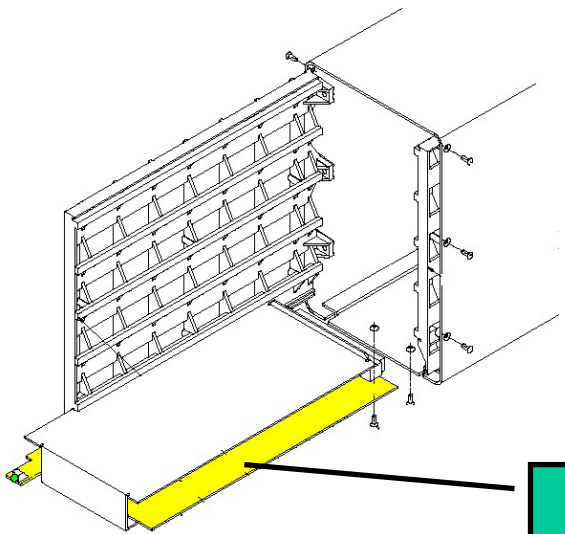


RAC4A Subassemblies

Data Acquisition PCB

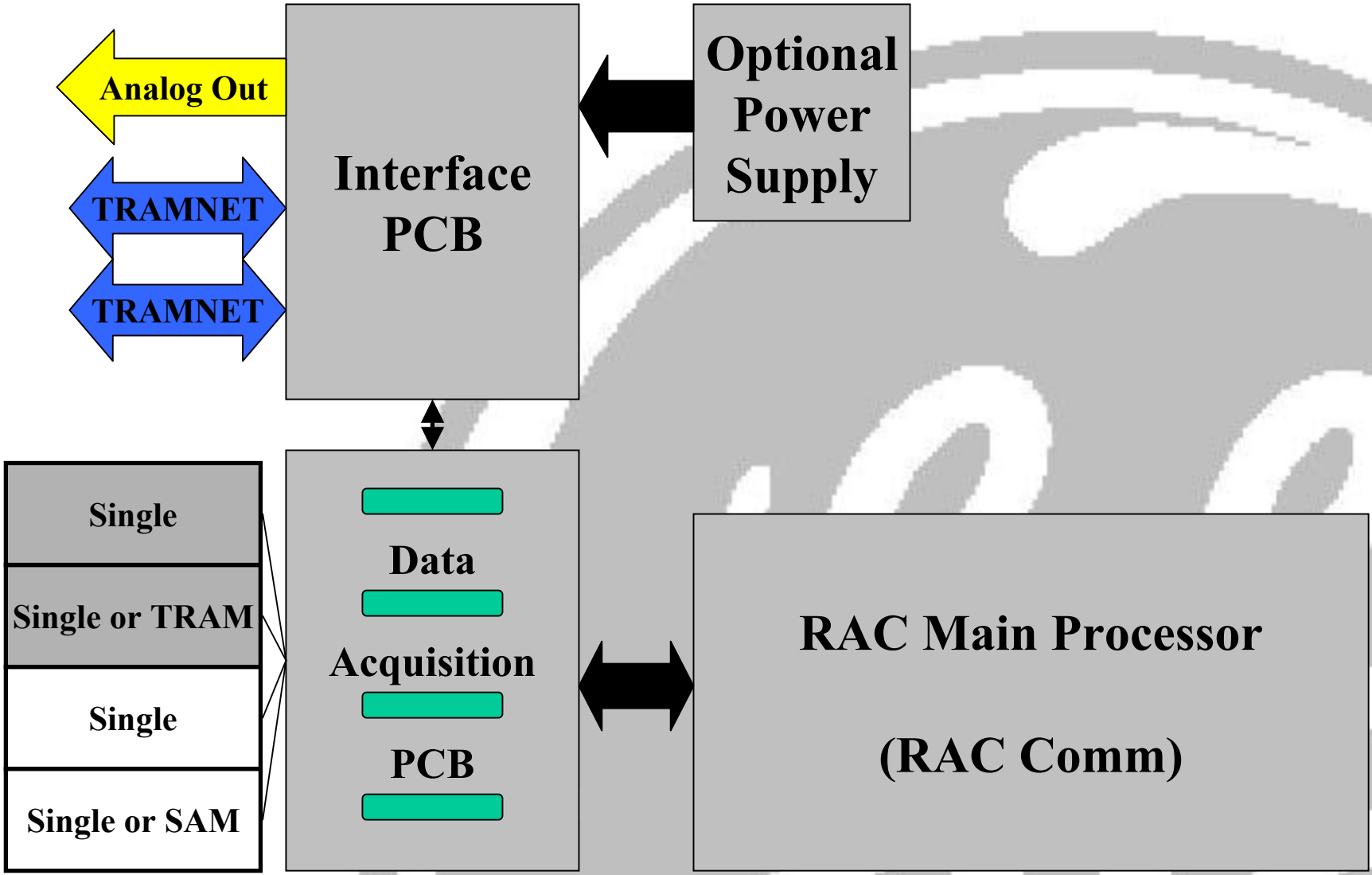


Interface PCB

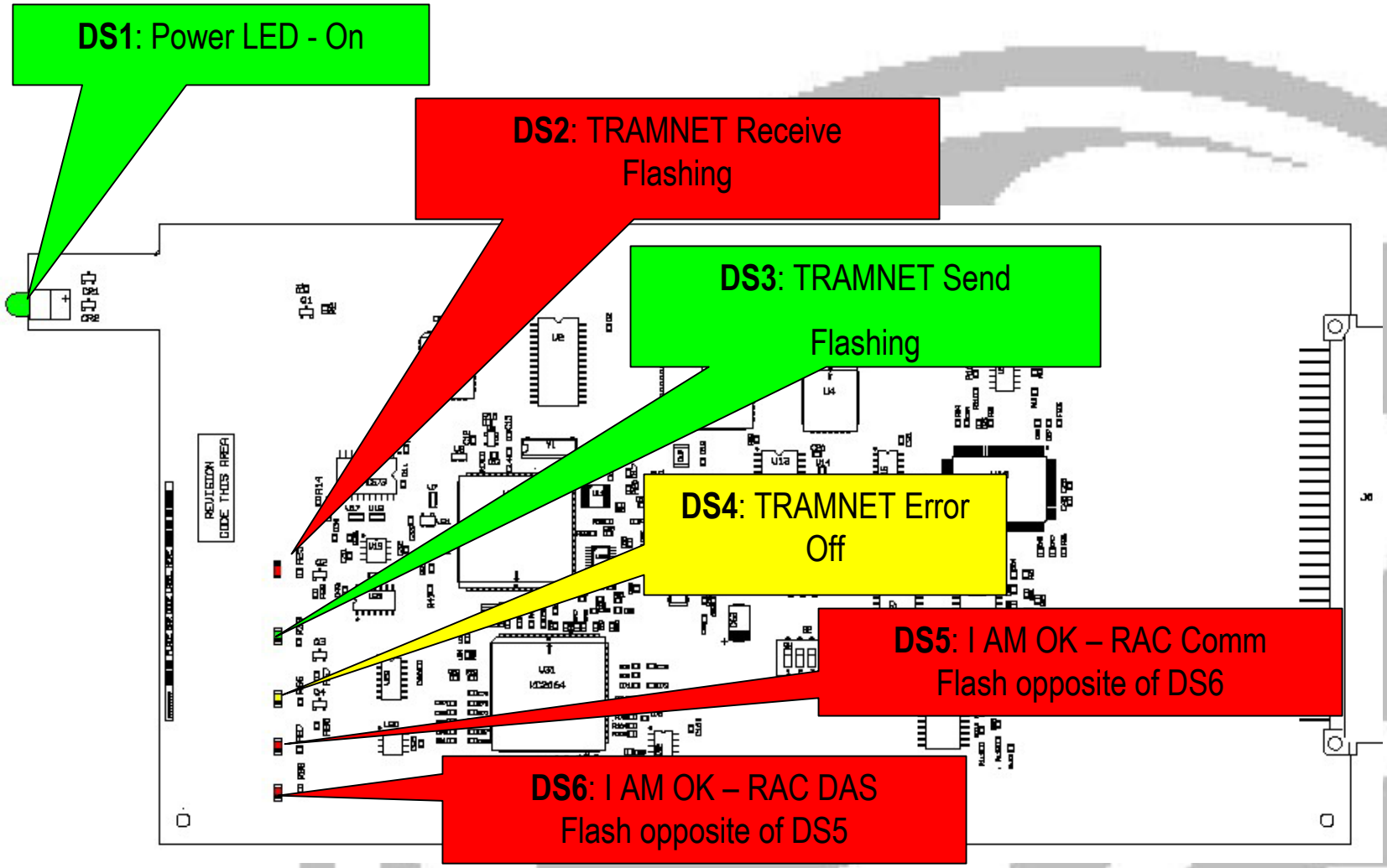


RAC Processor

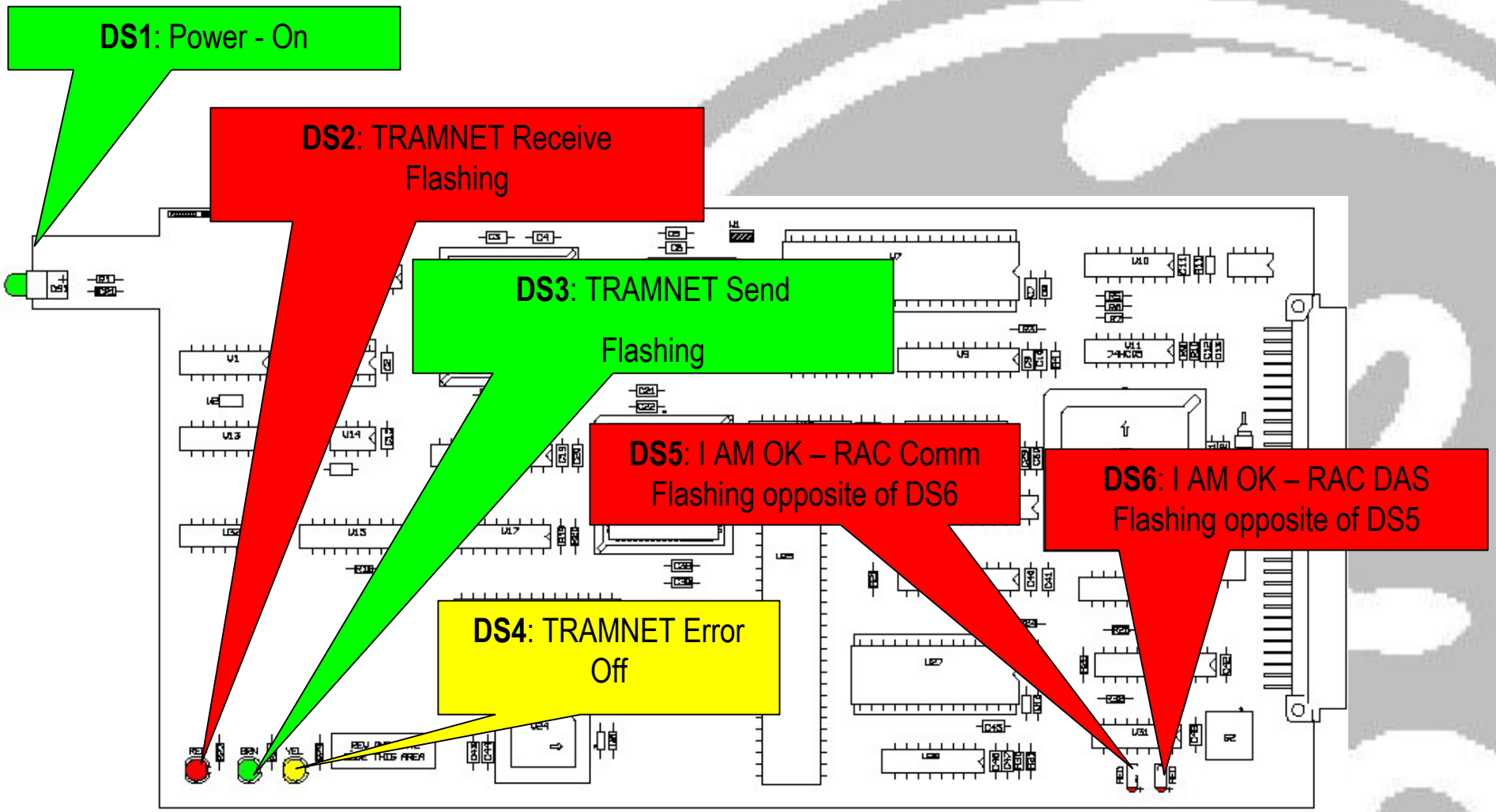
RAC4A Block Diagram



RAC Processor LEDs (new)


DS1: Power LED - On
DS2: TRAMNET Receive Flashing
DS3: TRAMNET Send Flashing
DS4: TRAMNET Error Off
DS5: I AM OK – RAC Comm Flash opposite of DS6
DS6: I AM OK – RAC DAS Flash opposite of DS5

RAC Processor LEDs (old)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